AMENDMENTS TO THE DRAWINGS

Please replace original Figure 2 with the attached replacements sheets for Figure 2. In particular in Fig.2D, the falling point of Vcb starts at the falling edge of V1b shown in Fig.2A.

Attachment: Replacement sheet

REMARKS

Claims 1-9 are pending in this application.

The drawings are objected to under 37 CFR 1.83a because Figure 2D is incorrect. This objection is respectfully traversed.

Applicant has provided a replacement sheet for Figure 2. Fig.2 shows correct waveform relationships among Figs.2A-2D. In Fig.2D, the falling point of Vcb starts at the falling edge of V1b shown in Fig.2A. Approval of the corrected Fig. 2D and withdrawal of the drawing objection are requested.

The disclosure is objected to because of the certain informalities.

In the specification on page 9, lines 1-3 "the steady-state voltage of the comparison signal V2 is equal to the voltage of the reference signal V1", applicant asserts that the voltage of the comparison signal V2 can become equal to the voltage of the reference signal V1 in the steady state under the operation of a closed-loop system according to the present invention. Applicant kindly reminds that "closed-loop" is an important factor while examining the system behavior.

First of all, it is well known in the art that the two input voltages of OP 121 in Fig. 4 in steady state of a closed-loop system should become the same. As had been mentioned in the specification, the resistor R2 can be omitted. For such a situation and according to the mechanism of the closed-loop system revealed in Fig. 4, the voltage V3a (V3b) should be V1a (V1b), the output voltage of the photo detector 14 should be V3a/G2 (V3b/G2) indicating the power of the laser light source 15 is Pa (Pb), and the corresponding voltage level inputted into the driving unit 13 is V4a (V4b), which can be obtained, say being measured during the power-on stage before its normal operating stage, or even calculated in the circuit design stage. However, how to measure V4a (V4b) is not the key point of the present invention, so it is not described. For convenience, the case that the power of the laser light source 15 is Pa is referred to be as a first case, while the case that the power of the laser light source 15 is Pb is referred to be as a second case.

By further setting the gain G1a (G1b) of the gain adjustable amplifier 41, one can thus derive the corresponding value V2a (V2b) and thus the voltage across the capacitor C in the steady state should be V2a-V1a=V4a/G1a-V1a (V2b-V1b=V4b/G1b-V1b). Since V1a, V1b, V4a, V4b can be known before the system starts its normal operation, a person in the art will recognize that by properly setting G1a and G1b, the goal V2a-V1a=V2b-V1b is achievable, i.e. the voltage across the capacitor in the steady state of each case can be maintained by adjusting the gain of the gain-adjustable amplifier. To speak more specifically, consider the goal V2a-V1a=V2b-V1b= D with D being a constant. It is then can be found that the corresponding G1a=V4a/(V1a+D) and G1b=V4b/(V1b+D). For a specific case shown in paragraph [27]: " the way for setting the gain of the gain-adjustable amplifier 41 for different laser power outputs is represented as:

G1a = V4a / V1a, and

G1b = V4b / V1b. ",

which will lead to V2a-V1a=0 and V2b-V1b=0, thus proving the specification page 9 lines 1-3 "the steady-state voltage of the comparison signal V2 is equal to the voltage of the reference signal V1".

The Examiner is therefore requested to reconsider and withdraw the objection to the specification.

Claim 1-9 are rejected under 35 U.S.C. § 112. This rejection is respectfully traversed.

Applicant asserts that the present invention as claimed in claims 1-9 should not be found unpatentable over 35 USC 112 because it is clear to a person skilled in the art.

For the opinion a. stated by Examiner:

The system shown in Fig. 4 is a closed-loop type of control system. Provided the voltage of the reference signal V1a(V1b) and according to the well known fact that the two input voltages of the op 121 should be the same in the steady state of a closed-loop control system as

well as the mechanism of the closed-loop system revealed in Fig. 4. Furthermore, as mentioned previously, the voltage level V4a (Vb4) inputted into the driving unit 13 can be previously measured before the entire system starts its normal operation.

In other words, V1a, V1b, V4a, and V4b can be derived before the system starts working. By further setting the gain G1a (G1b) of the gain adjustable amplifier 41, one can thus derive the corresponding value of V2a (V2b) and the voltage across the capacitor C in the steady state should be V2a-V1a=V4a/G1a-V1a (V2b-V1b=V4b/G1b-V1b). Since the values of V1a, V1b, V4a, V4b are all known, a person in the art will recognize that by properly setting G1a and G1b, an example had been given in the specification, V2a-V1a=V2b-V1b is achievable, i.e. the voltage across the capacitor in the steady state of each case can be maintained by adjusting the gain of the gain-adjustable amplifier. Therefore, the occurrence of charging/discharging of the capacitor C is reduced.

On the other hand, as shown in Fig.7 and discussed in paragraph [34] stating, "FIG. 7 illustrates an embodiment of the gain-adjustable amplifier. Referring to FIG. 7, **the gain-adjustable amplifier 70 includes an OP amplifier 71, a resistor R1, and a variable resistor R2**, wherein the variable resistor R2 is coupled between a negative input terminal and an output terminal of the OP amplifier 71. If the input signal Vin is coupled to the negative input terminal of the OP amplifier 71 via the resistor R1, and a positive input terminal of the OP amplifier 71 is grounded, the output voltage of the OP amplifier 71 is: Vout = Vin * (-R2/R1). Consequently, the gain of the amplifier 70 is adjusted by varying the resistance value of the variable resistor R2". From the above, it can be seen that the gain-adjustable amplifier 70 comprises an OP amplifier 71. Indeed, the OP amplifier 71 may contain its own capacitor, which might also encounter charging/discharging while the gain of gain-adjustable amplifier 70 is changed. However, from the practical experience, the scale of the capacitor inside the OP amp 71 is much smaller than that of the capacitor C, the transient period is much shorter. Therefore, in contrast to the reduced charging/discharging time of the capacitor C introduced by the present invention, the charging/discharging time of the OP amp 71 can be ignored.

For the opinion b. stated by Examiner: **the specification does not adequately teach why adding the gain of the gain-adjustable amplifier can rapidly generate a correct drive signal to achieve the desired voltage signal to be fed to the drive unit.** As understood by Examiner: Due to a delaying by the comparator C (Figure 4, element 12) and then by the gain-adjustable amplifier (Figure 4, element 41), the steady-state voltage of signal V4 to be fed to the drive unit (Figure 4, element 13) is prolonged. **It is questioned how can the drive unit rapidly generate a correct stable signal to achieve desired output power level of the laser light source?**

As mentioned in the specification and also proven in the above paragraphs, the specification had revealed that "By making the voltage difference between the comparison signal and the reference signal substantially the same, the voltage Vc across the capacitor C will then be kept substantially the same, which in turn reduces the occurrence of charging/discharging the capacitor C, therefore the time for the automatic power controller to reach its new steady state is shortened while changing the laser output power."

On the opposite, for the conventional system, "the comparison signal V2 of the OP amplifier 121 will not reach its steady state until the capacitor C finishes its charging/discharging.... However, such a design will then result in that the automatic power controller 10 needs a long time to reach the steady state", mentioned in the specification. Clearly, since the charging/discharging time of the capacitor C is reduced due to the same steady-state voltage difference across the capacitor C according to the present invention, the voltage V2 and V4 can reach their respective expected steady-state voltage level more rapidly to generate a correct stable signal to achieve desired output power level of the laser light source.

For the opinion c. stated by Examiner:

Applicants point out that the gain of the gain-adjustable amplifier 41 is predetermined

for each case by the equations:

G1a = V4a / V1a, and

G1b = V4b / V1b.

Surely, as mentioned previously, the values that **G1a = V4a / V1a, and G1b = V4b / V1b** are utilized to achieve the special result of V2=V1. For other cases, those skilled in the art can easily find other reasonable gains to make (V2-V1) the same for each case.

Please note, the set of the possible gain of the gain-adjustable amplifier is a finite one. In the example shown in the specification, the set of the possible gain is {G1a, G1b}. Therefore, a person in the art will recognize that the design of such a gain-adjustable amplifier is simple. As mentioned in the specification, "Referring to Fig.7, the gain-adjustable amplifier 70 includes an OP amplifier 71, a resistor R1, and a variable resistor R2, wherein the **variable resistor R2** is coupled between a negative input terminal and an output terminal of the OP amplifier 71. ... Consequently, the gain of the amplifier 70 is adjusted by varying the resistance value of the variable resistor R2 ". A person in the art will recognize that a variable resistor is really easy to implement.

Furthermore, the paragraph [7] and [8] stating:" The automatic power controller 30 utilizes the first signal source 31 to generate a control voltage signal, and the control unit 33 to **switch the switch SW1** when laser light output power is changed so as to let the control voltage signal to be fed to the drive unit 13 at the beginning of each laser light power changing progress. Therefore, the drive unit 13 may rapidly generate a correct drive signal to achieve desired output power level of the laser light source 15. Next, the automatic power controller 30 **utilizes the switch SW2** to directly output the high voltage (Vcc) or the ground voltage to the OP amplifier 121 at the beginning of each laser light power changing progress so as to make the capacitor C charge/discharge rapidly. Finally, the automatic power controller 30 **utilizes the control unit 33 to detect the output voltage of the OP amplifier 121 and the output voltage of the first signal source 31. When both of the output voltages are close to each other,** the states of the switches SW1 and SW2 are switched back such that the automatic power controller 30 is switched back to the normal operating mode."

Therefore, even if a control unit is required to switch the gain-adjustable amplifier 41

between different states (for example, to adjust the variable resistor R2), the present invention can directly change the gain value of the gain-adjustable amplifier 41 from G1a to G1b **without controlling a plurality of switches, detecting the voltage level of the output of the OP amp 121, or comparing the voltage level of the output of the OP amp 121 with the output voltage of the first signal source 31.** Obviously, in contrast to the conventional automatic power controller 30 shown in Fig.3, the present invention automatic power controller can be simpler.

In view of the above amendment, applicant believes the pending application is in condition for allowance. The 35 USC 112, rejection should be reconsidered and withdrawn. Favorable reconsideration and an early Notice of Allowance are solicited.

Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), Applicants respectfully petition for a one (1) month extension of time for filing a reply in connection with the present application, and the required fee of $120.00 is attached hereto.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

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Respectfully submitted,

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Attachments

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